

## CLAIMS

1. An internal combustion engine comprising  
a piston reciprocating in a cylinder;  
5 air inlet means communicating with the cylinder;  
exhaust means communicating with the cylinder;  
an indirect combustion chamber communicating with the cylinder comprising a near  
end and a far end in relation to the piston;  
a transfer orifice communicating with the cylinder and the combustion chamber at its  
10 near end;  
spark ignition means communicating with the combustion chamber;  
a fuel injector communicating with the combustion chamber;  
a controller to control the fuel injection process and spark ignition event;  
characterised in that the transfer orifice is adapted to deliver a jet of air into the  
15 combustion chamber during the compression stroke of the piston forcing air  
movement around the periphery of the combustion chamber in helical swirl motion in  
the axial direction away from the near end, and in that the fuel injector is adapted to  
deliver some fuel into the said jet of air within the chamber in a direction which also  
enables a spark ignitable mixture to form in the gas arriving at the spark ignition  
20 means.
2. An engine according to claim 1 wherein the fuel injector is situated to deliver fuel into  
the jet of air at an angle to the axis of the jet of air.
- 25 3. An engine according to claim 1 wherein the fuel injector is situated to direct fuel  
delivery towards the far end of the combustion chamber.
4. An engine according to claim 1 wherein the clearance volume above the piston at the  
end of the compression stroke is minimised.  
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5. An engine according to claim 1 wherein the fuel injector is situated to deliver fuel directly towards the said jet of air along an axis coincident or parallel with the axis of the said jet.
- 5 6. An engine according to claim 1 wherein the said spark ignition means is situated at the far end of the said combustion chamber.
7. An engine according to claim 1 wherein two spark ignition means are used to effect ignition at two different locations.
- 10 8. An engine according to claim 1 operating on the two stroke cycle.
9. An engine according to claim 1 operating on the four stroke cycle.
- 15 10. An engine according to claim 1 wherein air induction into the cylinder is not throttled at part load.